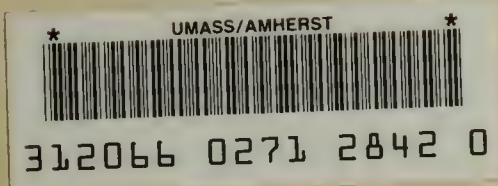


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Guide to Agricultural Composting



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GUIDE TO AGRICULTURAL COMPOSTING

Preface

Building on the efforts of a small group of Massachusetts farmers, the Massachusetts Department of Food and Agriculture (DFA) has actively encouraged on-farm composting since 1985. This ancient practice, which has its historic roots in agriculture, has recently been enthusiastically embraced by the solid waste industry. It is our purpose to recognize and promote the legitimate agricultural nature of farm-based composting.

Massachusetts farm-based composting operations presently handle over 100,000 tons per year of diverse materials at more than two dozen sites. These facilities range in scale of operation from several hundred tons to more than 30,000 tons per year. Increasingly, such organic materials are being diverted from traditional waste disposal options to become productive agricultural resources. Agricultural composting may both benefit commercial agriculture and serve the public need for safe and economically viable waste reduction capacity.

Farmers are motivated to undertake composting for a variety of reasons. These include:

- 1) composting is an appropriate management practice for manures and/or other organic matter generated in farming operations;
- 2) compost products may be utilized in on-farm soil and fertility management. On-farm composting may reduce input costs while permitting control of compost quality;
- 3) composting may generate revenues from charges for receiving organic by-products from off-farm sources and from sale of compost products.

Compost products provide multiple benefits when land applied in agricultural soils. These benefits include improved water holding capacity, improved soil structure and drainage, increased nutrient retention or cation exchange capacity, and increased organic matter and microbial activity. Composts are relatively stable forms of organic matter which may provide the full range of plant nutrients in a balanced and gradually released form. Although composts may not always supply all nutrients to crops, they may lower the requirements for highly soluble inorganic fertilizer applications, thus reducing risks of nutrient leaching and resultant water pollution concerns. Composts are also recognized as providing biological suppression of numerous plant pathogens and diseases. Following initial application, compost benefits may persist for many years.

Massachusetts communities, farmers, industries and other entities face increasingly costly and complex decisions regarding disposal of diverse organic materials. Agricultural composting has great potential to address these waste management concerns while enhancing the sustainability of our soil and water resources.

Gregory Watson, DFA Commissioner

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Guide to Agricultural Composting

Document Overview

The purpose of this Guide is to encourage and safeguard agricultural composting. Towards these ends, the Massachusetts Departments of Food and Agriculture (DFA) and Environmental Protection (DEP) have developed a regulatory framework that provides appropriate resource protection without unduly inhibiting farming activities. Part I of this document presents an overview of these regulations and relevant exemptions. Part II offers guidance in the areas of compost facility siting, design and management.

Part I. Environmental and Regulatory Considerations

In general terms, composting is defined as "the accelerated biodegradation and stabilization of organic materials under controlled aerobic conditions." Agricultural composting, defined as "the composting of certain organic materials, including animal manures, vegetation and food processing by-products, for beneficial (on farm or off-farm) agricultural use," is a distinct sub-set of composting activity. Depending on the scale of the operation, siting and the nature and sources of materials being composted, agricultural composting may be viewed as an agricultural practice or as solid waste management. This important distinction has significant financial and legal implications for agricultural composters.

A. The Need for Regulatory Approval

With a few, specific exceptions, solid waste facilities require a "site assignment." At issue over the past few years has been whether farms, when undertaking the time honored agricultural practice of composting "wastes" from their own operations and other sources, have been engaging in solid waste management activities and are, thus, subject to regulatory control. Through collaboration, DEP and DFA have undertaken joint responsibility for agricultural composting oversight. Specifically, DEP has granted conditional exemptions from regulatory control and DFA has established a registration process supported with technical assistance to interested farms.

1. The Role of DEP

The following excerpt from DEP's Site Assignment Regulations clearly states the parameters within which farms can operate without undue regulatory control:

310 CMR 16.00: Site Assignment Regulations for Solid Waste Facilities

16.05: Applicability

"(3) Conditionally Exempted Operations. The following operations do not require a site assignment provided the operation incorporates good management practice, is carried out in a manner that prevents an unpermitted discharge of pollutants to air, water, or other natural resources of the Commonwealth and results in no public nuisance:...

(c) backyard composting;

(d) disposal of wood wastes at a single family residence or farm where the wood wastes are generated and disposed within the boundaries of such farm;...

(f) the use of agricultural manures in normal farming operations;

(g) a composting operation for agricultural wastes, when located at an agricultural unit as defined in M.G.L. c.128, s. 1A;

(h) a composting operation, when located at an agricultural unit as defined in M.G.L. c.128, s. 1A, which in addition to agricultural wastes, utilizes only the following compostable materials, provided the operation is registered with and complies with policies of the Department of Food and Agriculture:

1. leaf and yard waste;
2. wood wastes;
3. clean newspaper and cardboard;
4. clean shells and bones;
5. non-agricultural sources of manures and animal bedding materials;
6. not more than ten tons per day of compostable material composed of generator pre-sorted produce, and/or generator pre-sorted vegetative residues from food or beverage processing that consists solely of materials from plants, (e.g., husks, leaves, skins, sediments and roots) and other plant by-products from fruit or vegetable canning, freezing or preserving operations; and
7. not more than one ton per day of pre-sorted kitchen, restaurant and institutional food waste...."

2. The Role of DFA

Under the provisions of 330 CMR 25.00, Agricultural Composting Program, DFA provides assistance to agricultural composters through a review of regulatory issues affecting farm-based composters, and an agricultural compost facility registration procedure, as required in 310 CMR 16.05 (3),(g) and (h) (see above). Farms registered with the Department attain

status as "an agricultural operation conditionally exempted from site assignment as a solid waste facility." This registration recognizes the legitimate agricultural nature of such on-farm composting operations, resulting in minimal DEP regulatory control and exemption from related permitting and compliance fees. Because such fees may impose a significant financial burden on the start-up of facilities requiring site assignment, it is prudent that agricultural composters be fully informed of regulatory exemptions offered under 310 CMR 16.05 (3).

The DFA defines agricultural composting as "the composting of agricultural wastes and other compostable materials on an agricultural unit, resulting in stabilized compost products for agricultural and horticultural purposes." Agricultural waste is defined (in 330 CMR 25.02) as "discarded organic materials produced from the raising of plants and animals as part of agronomic, horticultural, or silvicultural operations, including but not limited to animal manure, bedding materials, plant stalks, leaves, other vegetative matter and discarded by-products from the on-farm processing of fruits and vegetables." Compostable materials allowed for use in operations registered with DFA as agricultural composting facilities are set forth in 330 CMR 25.04, (1) and (2), as follows:

- (1) Registered agricultural compost operations can only use defined agricultural wastes and other compostable material allowed by DEP regulation pursuant to 310 CMR 16.05, (g) and (h), whether those materials are generated on-site or off-site.
- (2) Physical contaminants must be removed from the raw materials prior to mixing at the compost site. Separated physical contaminants must be appropriately disposed. Materials received from off-site locations must be source separated.

Agricultural composters considering materials from off-farm sources not listed in 310 CMR 16.05 (h) should be aware that use of such materials (e.g. meat and fish wastes) requires DEP site assignment as a solid waste facility.

NOTE: Agricultural composters desiring to make claims regarding product nutrient content or other product performance qualities are referred to 330 CMR 25.05 (5); M.G.L. c. 128, ss 64 through 83. All other DEP regulatory requirements, for example those concerning water and air quality, will apply to farm composters, regardless of size of operation or sources of materials. For assistance with regulatory questions not fully addressed in this document, composters are advised to contact DFA.

B. Assessing an Operation's Suitability for Agricultural Exemption.

One can make reasonable judgements on a composting operation's complexity and environmental and health impacts by evaluating the following considerations:

1. Compostable Material Quality

Control of compostable materials quality is critical for blending a consistently appropriate "recipe," and ultimately, for the quality of compost produced. Responsibility for quality control of compostable materials for on-farm composting falls upon the farmer/operator.

Determining the quality of compost materials is also crucial in the regulatory process. Other than the factors mentioned in the DEP and DFA composting regulations, there are no required quality control specifications for compost materials. However, one private sector composter has established quality control parameters for internal use which call the compostable materials' detrimental features "contaminants." The following discussion of these contaminants offers both composters and regulators a set of guideline in ascertaining the quality of compostable material.

"A contaminant is any foreign presence, physical, chemical or biological in nature which if exceeding a certain limit may have undesired effects on the composting process or product. Contamination is thus not necessarily restricted to presence of toxic or hazardous compounds, but includes objects which impart undesired traits to the compost product or which entail danger to workers.

Physical contaminants are objectionable objects including but not limited to glass, metal, plastic, paper and cloth. The presence of physical contamination in excess of 5% of total weight could be considered unacceptable. Dilution of solids material by excessive amounts of water, sand, soil, cement or the like would also be unacceptable.

Biological contamination includes the presence of biologically derived agents including but not limited to: dead animals, fly larvae, pathogens and fungal mold. Limits for these items or processes that safeguard against adverse effects should be established.

Chemical contamination falls into two broad classes: inorganic chemicals, such as metals; and organic hydrocarbon compounds such as pesticides and herbicides. These contaminants should be restricted in accordance with recommended federal and state tolerance limits for land application, Massachusetts Type I specifications, and some predetermined order of magnitude for food crop limits. Table 1 lists DEP Type I criteria for heavy metals in sewage sludge.

TABLE 1: DEP Heavy Metals and Chemical Content Criteria for Type I Sludge
(from 310 CMR 32.00, Regulations for the Land Application of Sludge and Septage)

<u>Heavy Metals or Chemicals</u>	<u>Maximum Allowable Concentration in Parts Per Million Dry Weight</u>
Cadmium (subject to proposed changes)	2
Lead	300
Nickel	200
Zinc	2500
Copper	1000
Chromium (Total)	1000
Mercury	10
Molybdenum (subject to proposed changes)	10
Boron (water soluble)	300
PCB's 1-2 (depending on end-use)	-

These limits can serve as a guide to evaluate the risk factor of the heavy metals content in compostable materials and/or compost. Type I category sludge is intended for unrestricted public use, whereas Types II and III products have restricted uses (see 310 CMR 32.00 for more information regarding land application of sludges). These and other potential risk factors should be discussed with state and local regulatory officials.

Physical, biological, and chemical contaminants should be considered when deciding how to regulate an agricultural composting project using non-farm materials. The simpler the compostable materials are, the simpler the approval process should be. In some cases, clean non-farm material composted on farms should be classified as a "resource material for beneficial purposes," instead of a "solid waste," and thus require no formal approval process.

2. Scale of Operation

Another important consideration in evaluating appropriate regulatory oversight of an agricultural composting project is the size of the operation. Under the Solid Waste Facilities section of Massachusetts law, a Massachusetts Environmental Policy Act (MEPA) review may be required by the applicant, based on facility size and number of tons of material handled per day. Under MEPA, if a facility, such as an agricultural composting operation that accepts non-farm material deemed as non-exemptible, handles 50 or more tons per day of material, then the operator is required to file an Environmental Notification Form (ENF) with the state MEPA office prior to receiving state plan approval. Based on the ENF, MEPA will determine if an Environmental Impact Report (EIR) is required.

If a solid waste facility handles 300 or more tons per day of material, then an EIR is required. Potential operators should consult with regional DEP and MEPA staff on this

matter. Although MEPA regulations may serve as a useful rule of thumb for measuring the application of regulations to the size and capacity of a composting facility, their criteria may be considered too stringent, as some dairy farms which might compost wish to compost already produce 50 tons of manure per day.

C. Obtaining Plan Approval

Regulatory control exists because there have to be some safeguards present. It is important to note that the approval process is not only a regulatory process. Approvals ultimately are determined in the community and neighborhood of the facility. An applicant needs to inform the community and local and state officials about the composting process and the specific operation. A site assignment can prove to be lengthy, expensive and futile for a simple facility if good public relations are not established and maintained.

It is recommended that a composter meet with all involved parties to have an exchange of concerns before undertaking operations. Preliminary meetings will help avoid surprises and delay. Tours of the proposed site and of an operating compost facility for officials and neighbors, a citizen advisory committee, slide shows at public meetings, and offers to help the town with a disposal problem through composting are some suggestions to help encourage support. Also recommended are preliminary discussions with the Soil Conservation Service (SCS), Cooperative Extension agents, and DFA staff.

1. Local Approval: Board of Health and Conservation Commission

Agricultural composters should inform the local Board of Health of any plans to handle off-farm materials at farm facilities. Although Boards of Health may not have a formal role in the approval process, they do retain authority to issue cease and desist orders if they find some aspect of the operation unacceptable. Also, Boards of Health must be accountable to both immediate neighbors and the broader community. It is prudent that the Board of Health be aware of activities at composting operations.

The local Conservation Commission will confirm site compliance with existing wetland or floodplain restrictions.

2. Preparing a Compost Facility Plan Proposal

A well developed plan facilitates the compost facility approval process. The applicant composter needs to reassure the approving bodies that the operation is well planned and safe. In most cases, the plan should not require engineering reports or detailed scientific descriptions of the composting process. However, it should include a narrative description of the proposed operation, maps and drawings of the proposed operation.

a. Narrative. A narrative description should address the following basic issues in a simple and concise manner.

- 1) **Compostable Materials:** Name or describe materials to the extent that they are known in advance. Estimated volumes or weights to be composted. How will the material be prepared for pile construction? What is the planned compost "recipe" or ratio of compostables? Are any materials available seasonally or intermittently?
- 2) **Aeration:** What method, frequency and equipment will be used for aerating the composting piles?
- 3) **Moisture and Temperature Levels:** How will adequate moisture and temperature levels in the composting piles be maintained?
- 4) **Mixing and piling materials:** How will the composting piles be constructed and located on the site? Give the height, length and width of the piles.
- 5) **Composting Time Duration:** How long will the composting period take from beginning to finished product.
- 6) **Site Design:** How large is the site and how will it be prepared? Previously uses? Grade of the slope? Soil properties as indicated on a soil survey map? Sensitive areas in proximity to the site (e.g., residences, schools, etc.). Surface waters, water supplies (both public and private), slope and drainage characteristics, and any other pertinent environmental information may be considered.
- 7) **Roads:** What are the locations and conditions of all public and on-site access roads?
- 8) **Controls:** What are the plans for controlling: access and dumping on the site; drainage, leachate, runoff from precipitation; erosion and sediment runoff; odor; noise, flies, and other pests; fire; pathogens; litter; and dust.
- 9) **Staging Procedures:** Consider the planned staging procedures for the composting operation. Describe delivery and drop-off, storage and containment, where applicable.
- 10) **Personnel:** What personnel will be used and how will they be trained?
- 11) **Equipment:** What equipment will be used and for what purposes?
- 12) **Contaminants:** How will non-compostables be stored and removed from the site? Where will they be disposed?

13) Quality Control: How will the quality of compostable material and of the finished compost be monitored and maintained?

14) Contingency Plan: What is the contingency plan if contaminated material is delivered to the site or if the composting operation stops?

15) End-Use: What is the intended final use of the compost?

b. Maps. Maps will help describe the proposal facility in visual terms and assist in the planning of the operation. Maps are needed to delineate the boundary of the proposed compost facility and public access roads; public and private drinking water supplies; streams or ponds; "sensitive" activities such as hospitals, schools, playgrounds and homes that are located within one-half mile radius from the site.

Include the following characteristics regarding the proposed composting facility:

- 1) The property upon which a composting facility is proposed, drawn to scale.
- 2) Composting site boundaries.
- 3) Available utilities, locations of all buildings and other pertinent resources regarding the operation of the proposed facility.
- 4) Proposed location of the compost windrows.
- 5) Drainage characteristics, which shall identify the direction of liquid run-off both on and off the site. Also, locate existing public and private drinking water supplies and any test wells.
- 6) Composting staging and storage areas and on-site roads, which show the flow of on-site traffic.

c. Drawings. Drawings detailing windrow shape and size, flow of materials through the composting process and other pertinent information that is specific for the proposed operation, would be useful for describing the operation.

Part II. Siting, Designing and Operating an Agricultural Composting Facility

The following information has been adapted from literature directed toward the leaf and yard waste composter. The most notable reference is the Leaf and Yard Waste Composting Guidance Document prepared by DEP, Division of Solid Waste Management. This offers a general discussion and is not specifically directed toward any one method or material.

A. The Principles of Composting

A knowledge of composting principles is important for an appreciation and understanding of the reasoning behind the site and plan development recommendations. The following overview explains some of the basic ideas behind composting.

1. Composting

Composting digests diverse organic materials through a controlled aerobic decompositions by microorganisms, causing transformations which release energy in the form of heat. Composting merely controls the conditions of a natural biodegradation process so the materials decompose more efficiently.

Composting generally occurs in two stages: primary and secondary. The primary stage is the active high heating stage where temperatures range between 100 and 140 degrees Fahrenheit and biodegradation occurs most rapidly. The secondary, or curing stage, is the less active, low heating stage where temperatures range between 50 and 100 degrees Fahrenheit and further decomposition and stabilization occur at slower rates.

2. Compost

Compost is a dark-colored, humus-like material and a valuable soil conditioner. Stabilized compost can be easily and safely handled, stored and applied to soil without adversely affecting the environment. Composts contain the full range of plant nutrients in balanced organic forms that release gradually in the soil. Multiple benefits may result from their application to soils.

3. Composting Conditions

Composting is a biological process that requires conditions supportive of microbiological activity. When these conditions are satisfied and in balance with each other, composting will occur most efficiently. The microorganisms necessary for composting require oxygen, water, food energy and an environment that is conducive to survival. Maintaining a proper balance of these conditions is the composter's primary responsibility in establishing effective composting activity.

a. Moisture Content. Moisture is an essential component of organisms. It is therefore, important that sufficient free water exists to provide this moisture. On the other hand, too much water in a compost mass will inhibit the flow of oxygen and turn the pile anaerobic. This will slow the composting process and create odors. A compost pile requires between 40%-65% moisture levels to maintain high rates of microbial activity. Typical dairy manures may contain more than 80% moisture and will not retain sufficient air for composting activity

unless blended with dry and absorbent materials to attain an overall moisture content below 65% that will allow air flow through the porous mixture. Excessively dry materials will require additional moisture from watering or blending with wet organic materials.

b. Oxygen Content. Oxygen is an essential element for the rapid decomposition of organic compounds by composting. If the oxygen content drops below 5%, the aerobic organisms will cease activity and the pile will turn anaerobic. Anaerobic conditions result in production of compounds that have strong and irritating odors while overall decomposition is slowed. Therefore, maintaining conditions that favor aerobic activity is essential in a well managed composting operation. This is most commonly accomplished by periodic turning of the materials during active composting so that all areas of the materials are exposed to sufficient amounts of oxygen.

c. Nitrogen Content. Nitrogen is also an essential element of organisms. The ratio of carbon to nitrogen (C:N) is an important determinant in the speed and efficiency of the compost process. At ratios higher than 35:1, nitrogen will be a limiting factor and the composting process will slow down. At ratios lower than 15:1, there will be excess nitrogen, which will be driven off as ammonia and lost from the final product. Hen manure and fresh grass trimmings are nitrogen rich materials with low C:N ratios, while dry leaves, sawdusts, and paper products are nitrogen poor materials with high C:N ratios.

d. Carbon Availability. Carbon compounds provide the energy source(food) for composting organisms. The quality of the carbonaceous material is important in terms of its availability to the microorganisms. The speed of the composting is determined by the ease with which the carbon material is broken down into available forms. Straw is readily decomposed and wood chips are not. Thus, the carbon availability and not just the carbon content should be factored in when determining C:N ratio.

e. Temperature. The microbial activity in composting materials will increase the temperature of the composting mass unless the heat is transferred out of the pile. Pile temperature affects the microbial population. If composting occurs between 50 to 100 degrees Fahrenheit (F), the process is classified as mesophilic. At temperatures between 110 and 160 degrees F., the process is classified as thermophilic. Most compost piles operate some of the time in both ranges. Thermophilic ranges are generally recommended to kill pathogens and weed seeds. Some compost scientists argue to not allow the pile temperature exceed 140 F. because it would reduce the composting efficiency by introducing

another class of less efficient thermophiles. It is recommended to maintain temperatures between 100 and 140 F during the active composting phase and between ambient air temperature and 100 F during the curing phase.

f. pH. The pH level affects the organisms active in the compost process. Composting occurs rapidly at the mid-range of 6 to 8. The compost process is impeded at pH extremes. High pH will drive off nitrogen as ammonia and persistently acidic pH is indicative of prolonged anaerobic conditions. When done properly, the compost process tends to neutralize the pH of the pile mass.

g. Surface Area. Composting occurs on the surfaces of the particles being composted. The greater the surface area to volume ratio, or the smaller the particle size, the more rapid the decomposition. Initial preparation such as grinding or shredding, may be necessary to achieve adequate surface area for some materials. Sawdusts decompose more rapidly than wood chips. Shredded leaves decompose more readily than unshredded leaves.

h. Time. The composting process begins as soon as an appropriate mix of materials is piled together and continues until decomposition is completed. The whole process may be accomplished in as little as two or three weeks under optimal conditions, but usually occurs over a period of two months or more. Frequent turning and mixing of the pile during the early stages of the process along with monitoring of moisture, temperature and texture are the factors most likely to hasten the process.

B. Compost Facility Siting

Proper site selection is a prerequisite to the establishment of safe and effective composting facilities. The location of a composting facility directly impacts the amount of site preparation required and the measures needed to satisfy environmental and regulatory. Farmers should take care in site selection as a means of controlling design/construction costs and operational problems over the life of the facility. Thoughtful selection of compost sites will prevent most site related problems of a regulatory nature as well as aesthetic and personal concerns of neighbors and other community members. Siting compost facilities out of public view and at reasonable distances from neighboring houses or other sensitive areas are examples of fundamental criteria for compost facility establishment.

The following five primary criteria should govern the site selection process.

1. Protection of Water Resources

Sites need to be evaluated for their potential impact on water resources. Of primary concern are proximity to public water supplies, wetlands, floodplains, surface waters, and depth to groundwater.

a. Sites must not be located within 400 feet (Zone I) of a public drinking water supply well

or within 250 feet of a private well. For sites within a Zone II or interim wellhead protection area (1/2 mile radius), the DEP may require that extra precautions be taken in the design or operations depending on the quantities and types of materials being handled. Sites within a Zone II may not be allowed under certain circumstances.

b. Siting must be in accordance with Massachusetts Wetlands Protection Act. This requires that a 100 foot buffer (Resource Protection Area) be maintained from any wetlands to the composting area. However, a site may be located within the 100 foot buffer of a wetland, provided that a Notice of Intent is filed with the local Conservation Commission and an Order of Conditions is given, permitting the encroachment into the buffer zone.

c. Sites should be located at least 100 feet from surface waters to ensure that there will not be any potential adverse impacts from compost site run-off. However, as in the case of the wetland buffer described above, a site may be located within the 100 foot buffer provided that a Notice of Intent is filed with the local Conservation Commission and an Order of Conditions is given by that Commission permitting the encroachment into the buffer zone.

d. Soils should be permeable enough to minimize run-off, yet capable of filtering drainage waters. Excessively well-drained soils(sandy) should be avoided, if possible, as they may lack the physical properties necessary for effective filtering of potential contaminants. Highly impermeable soils(clay) should be avoided, if possible, as this may lead to poor site drainage, poor operating conditions, and excessive run-off or erosion of the site.

e. Sites where groundwater rises to less than 4 feet or where the bedrock is closer than 5 feet from the surface should be avoided. Such conditions may lead to an operating surface that is too wet, as well as potential discharges of nutrients to groundwater.

Site selection is an extremely important decision that should be made only after careful deliberation, as each situation is unique. Many of the factors that one should consider are discussed below, yet familiarity with local circumstances is essential and cannot be reduced to written instruction.

With the recent rate of Massachusetts land development many farmers are obtaining new and close neighbors who like the idea and view of living next to a farm, but not the odors and noises of a farm. In these situations, the close proximity of sensitive areas may actually warrant the use of composting instead of the alternative practices like the spreading or stockpiling of raw manures. Therefore, sensitive areas may be a good reason to compost in some cases and applicants should not rule out composting because of the proximity of sensitive areas. However, management of composting is especially critical when done in proximity to sensitive areas.

2. Buffer to Sensitive Land Uses

Sites should be buffered from sensitive adjacent land uses such as residences, schools, and parks. Buffers, including both distance and visual screening, minimize impacts of any noise, odor, litter, and aesthetic degradation. A distance of at least 250 feet from the composting site to the nearest residence is recommended. However, in each case, the buffer must be adequate to satisfy the concerns of neighbors.

3. Area Requirements

Sites must be of adequate size to handle the projected volume of material to be composted. There are no standards in area requirements for composting. With each set of technological and design options, there is a different area requirement. A recent survey of agricultural and municipal composting facilities concluded that there is no significant correlation between tons per day (tpd) processed and acres per site. The only evident correlation was an increase in total acreage with increasing tonnage. A useful rule was derived, however, that a buffer of five acres plus one acre for each 20 tpd processed is needed. Thus, a 100 tpd facility should plan on having a ten acre site.

4. Site Preparation Needs

Site design and preparation needs can be a significant cost of start-up with composting facilities. Sites that are open, nearly level, and needing minimal surface preparation are preferable. A gentle slope (1-3%) is optimal to permit water run-off, allow materials handling and equipment operations. Grading and surface preparation may be required where existing soil conditions and grades do not allow for proper and controlled drainage and equipment operations during wet periods. Slopes that are excessively steep may limit site operations due to reduced materials capacity, equipment maneuvering problems, and run-off/erosion problems.

5. Accessibility and Land Use Compatibility

Composting sites should be compatible with existing land uses at farms. The facility should be readily accessible for all vehicles and equipment normally expected on the site. Sites must be secure from indiscriminate access that might lead to potential vandalism or dumping of unwanted materials. Neighborhood concerns are a real and very important aspect of compost facility siting and operations. It is recommended that composting site operators maintain communication with neighbors and the local community during planning and operational stages of composting facilities. Failure to recognize such concerns (either real or imagined) can lead to frustration and opposition from neighbors as well as local officials. Composting must be undertaken with a clear understanding of operator responsibilities. A well-managed facility that appears carefully established and orderly is likely to gain support from the local community.

C. Compost Facility Design

The facility must be designed to promote efficient operation and to minimize adverse environmental effects. Design requirements vary with the level of technology utilized at the facility and the physical characteristics of the site. Farmers should consider the following issues when planning for composting significant volumes of materials.

1. Site Clearing and Grading

The site must be cleared, if necessary, to provide adequate space for the composting operation. Perimeter vegetation could be retained for access control, noise reduction and aesthetic screening. A favorable perimeter could lead to positive public relations within the community and a reduction in siting opposition. Grading is part of the site preparation, and regrading should be planned for where necessary.

2. Drainage Control

Drainage should be devised to prevent sediment from running off the site into nearby surface waters. Surface water should be diverted away from the compost and curing piles to prevent excessive wetting. The system should also be able to handle excessive rainfalls. Diversion ditches or baled hay could provide adequate runoff control at most sites. Nutrient laden runoff should not be leaving the site.

3. Pile Location and Design

a. Pile Location. Windrows should run up and down instead of across slopes to allow leachate and runoff to move between the piles rather than through them. It will also minimize ponding. Compost piles should be spaced adequately, allowing for operation of equipment between them.

b. Prepared Surfaces. The use of impermeable pads is suggested where soils are highly permeable and groundwater rises too close to the surface. The pads would prevent the downward flow of leachate and the upward flow of moisture into the piles and provide a surface capable of supporting heavy equipment. Where a high water table is not of concern, a permeable material such as gravel and loam would be useful, especially for maintaining the site surface. Avoid sites that are inaccessible for extended periods.

4. Roads

The purpose of on-site roads is to make drop off and pick up of material as easy as possible. They should be designed for a circular traffic pattern where feasible and four-season use. Access roads should be capable of supporting delivery and fire vehicles and designed for minimizing erosion. An orderly egress and ingress should be possible to the site.

5. Access Control

Access control prevents illegal dumping and vandalism on the site. The level of security required is dependent upon the potential risks for illegal behavior. Gates, fences or cables at access points would prevent easy access. Natural barriers are also good inhibitors.

6. Signs

While most farm based compost operations will not need signs, those operations that are highly visible or that encourage drop-off by individuals may benefit from appropriate signs. A sign could be posted at each entrance indicating facility name, nature and operator. On-site signs would be helpful in directing vehicles to unloading and loading areas and indicating traffic patterns and cautions.

7. On-Site Water Supply

Facilities would want to have a water supply for wetting the piles, if necessary, and fire protection. Possible sources include natural water sources, wells, fire hydrants or water trucks. Water requirements would be based on the moisture content of incoming material. In some cases a water supply would not be required.

D. Facility Operation and Maintenance

Even well designed facilities, located on choice sites will prove problematic if not properly operated and maintained. One of the main considerations for evaluating operation and maintenance is to show an understanding of the composting process and environmental concerns.

1. Record Keeping

Operators would want to keep a log recording the volumes and/or weights, source and type of material received. The data will be useful in estimating the amount of compost that will be produced and for indicating the adequacy of the site for the future. Moreover, it will provide valuable information for settling business accounts.

2. Quality Analysis and Control

a. Inflow. The type of material to be accepted at the facility should be clearly stated, especially for deliveries of off farm materials. This practice will help settle disputes later if unwanted material - contaminants - should be found in a delivery. The section on contingency plans discusses this point further.

The incoming waste should be monitored for contaminants. Monitoring the composting piles, particularly during turning, would help identify contaminants also. Their identification will protect against a contaminated batch of compost and other environmental impacts. The establishment of a standard monitoring practice at the facility increases the efficiency of quality control.

b. Compost Product End Uses. Depending on the end-use and the type of materials composted finished compost may be analyzed for stability, nutrient content and contaminants. The frequency of testing depends on the conditions involved. For example, if the compost will be used on the farm and the raw materials were without a doubt clean, then testing of every batch would not be necessary. Stability testing and an occasional testing of contaminants for any possible changes in quality would be the major concerns. Test results reassure perspective buyers, farmers who use the compost and regulators of the quality of the product.

3. Equipment

The equipment required for composting depends on the composting method used. The current composting literature is rich with descriptions on composting methods and equipment, so one can refer to it for detailed discussion. In general, equipment might be necessary for the following activities: delivery and transport to and from the site; handling on site; turning and/or aerating of piles; monitoring temperature; watering; pre-processing the material; screening and spreading. A discussion of the equipment and their purpose would be useful in the proposal. Also, sharing low-use equipment with nearby farms and adapting existing equipment from other farm practices are inexpensive and practical means of operating an on-farm composting facility.

a. Delivery and transport to and from the site could be done with trucks or wagons, preferably self-unloading ones.

b. Handling on site material can be done with a front-end loader, shovel or a substitute.

c. Turning and/or aeration of piles are accomplished with; front-end loaders; enclosed reactor systems; mechanical aerating machines that are either self-powered and self-propelled or attached to a power source like a tractor; and perforated pipes placed under the piles and attached to mechanical blowers.

d. Monitoring temperature can be done accurately with a dial thermometer that has a stem long enough (36") to probe and measure the interior pile temperature. It is important to use a thermometer because the efficient turning and monitoring of piles depends on an accurate temperature reading.

e. Watering can be done with hoses, water trucks, back-pack watering units and other means used on the farm. Watering provides moisture and fire control.

f. Pre-processing the material might be necessary to break down a bulky item, separate undesirables or mix the heterogenous materials into a homogenous blend for more efficient composting. Shredders, grinders, chippers, pug mills, screeners, manure spreaders and anything else that will serve the purpose are applicable.

g. Screening the final product with a conventional screener or a sieve would improve the texture of the final product and remove undesirables or uncomposted items. Home-made screeners can also be used as long as they function well.

h. Spreading could be done with manure, lime or fertilizer spreaders depending on the nature of the spreader and the compost.

4. Composting Methodology

There are three basic composting methods, with many variations: windrow methods, aerated static-pile methods and in-vessel systems. Depending on the system and variation used, technology, raw materials, pile size, turning schedules and anticipated durations will differ.

a. Windrow Systems use front-end loaders or mechanical turners for turning and aerating the windrows. The raw materials vary greatly and pile size depends on the machine used to turn the pile. Adequate pile height ranges from four to ten feet and the length can be as long as desired and possible. The turning schedules and durations vary with materials, quantities, and weather conditions. Windrows are usually placed in open unpadded areas, but can be placed on pads and under cover.

b. Aerated Static Pile Systems are usually associated with sewage sludge composting. They use perforated pipes and mechanical blowers for aerating--turning is not required. They require durable bulking agents, like wood chips, to allow for passage of air. Depending on the aeration system, the duration of composting is between three and four weeks.

c. In-Vessel Systems are enclosed reactor systems that have many variations. The system could be in large bays or in completely enclosed tanks. The technology is more complex and usually more expensive than the windrow and static pile systems.

Once the composting method has been chosen, a brief description of it in the plan proposal would be useful.

5. Storage of Material Before and After Composting

a. Delivery, Storage and Mixing. Materials can be delivered to staging areas for storing and

mixing or directly to the area of pile formation. While delivery straight to the piles saves time and costs, staging areas speed up the delivery process, allow for more thorough mixing and lead to better pile formation. Delivered materials should be incorporated into composting piles before anaerobic conditions and resulting odors develop. Usually 48 hours is a reasonable limit, but it depends on the nature of the material.

b. Curing and Storing Compost. Adequate space should be provided for the curing and storage of compost. Because curing and stored compost have minimal odors, perimeter areas would be appropriate for them.

6. Storage and Disposal of Non-Compostables

In the unlikely event that large quantities of non-compostable material accumulate, an area should be designated for storage of such materials. A plan for weekly disposal of the objectionable materials that cause odors and other nuisances should be implemented.

7. Plan For End-Use of Compost

Indicate in the plan proposal the intended end-use of the compost. The end-use may change the requirements of quality control and analysis that one would face. A nursery growing ornamental crops and a vegetable farm could face different restrictions.

8. Personnel and Training

Indicate in the plan proposal the personnel and their past and planned training for composting. This would be helpful in reassuring others that the operators know what they are doing. Adequate training includes attending a composting conference, reading some informational material or prior experience in related agricultural activities.

9. Contingency Plan

A contingency plan is important because it will allow an alternative management plan in the event of contaminated deliveries, natural disasters, fiscal problems and equipment failures. An acceptable backup facility should be identified to remove the material from the site if necessary. If the facility storage space is at capacity, new material should not be accepted. If a contaminated delivery is made, the supplier should take the load back at his expense. This condition should be part of the agreement between the composter and the supplier.

10. Controls

Erosion, odor, noise, dust, pathogen, vector (flies, pests, rodents) and fire controls should be considered and administered when necessary. The potential for those problems to occur at the proposed facility should be addressed in the plan proposal.

Appendix A

330 CMR 25.00: AGRICULTURAL COMPOSTING PROGRAM

- 25.01: Purpose
- 25.02: Definitions
- 25.03: Agricultural Composting Registration
- 25.04: Composting Materials
- 25.05: Operation of Composting Facilities
- 25.06: Revocation of Agricultural Composting Registrations

25.01: Purpose

330 CMR 25.00 establishes criteria whereby the Department of Food and Agriculture may register and provide education and technical assistance to agricultural composting operations. Agricultural compost operations registered by the Department of Food and Agriculture are conditionally exempt from site assignment pursuant to the Department of Environmental Protection regulations (310 CMR 16.05(3)(g) and (h)).

25.02: Definitions

Agricultural Composting: the composting of agricultural wastes and other compostable materials on an agricultural unit resulting in stabilized compost products for agricultural and horticultural uses.

Agricultural Unit: land which conducts activities listed in M.G.L. c. 128, s. 1A.

Agricultural Waste: discarded organic materials produced from the raising of plants and animals as part of agronomic, horticultural or silvicultural operations, including but not limited to animal manure, bedding materials, plant stalks, leaves, other vegetative matter and discarded by-products from the on-farm processing of fruits and vegetables.

Compostable Material: an organic material that has the potential to be composted, excluding wastewater treatment residuals, which is not co-mingled or contaminated by significant amounts of toxic substances.

Composting: a process of accelerated biodegradation and stabilization of organic material under controlled conditions yielding a product which can safely be used.

Department: the Department of Food and Agriculture.

DEP: the Department of Environmental Protection.

Disposal: the final dumping, landfilling or placement of solid waste materials into or on land or water or the incineration of solid waste.

Physical Contaminants: any non-biodegradable material such as plastic, metal, glass, stones, or masonry debris.

Registration: approval by the Department as an agricultural composting operation.

25.03: Agricultural Composting Registration

The Department may register agricultural composting operations if the Department determines that:

- (1) the compost operation is located on agricultural unit;
- (2) the applicant has submitted a completed application;
- (3) the applicant agrees to a site visit and to comply with the Department's Agricultural Compost Guidelines;

25.03: continued

- (4) the applicant demonstrates knowledge and capability to conduct the agricultural composting operation to produce a stabilized compost product.

25.04: Compostable Materials

- (1) Registered agricultural compost operations can only use defined agricultural wastes and other compostable material allowed by DEP regulation pursuant to 310 CMR 16.05(g) and (h) whether those materials are generated on-site or off-site.
- (2) Physical contaminants must be removed from the raw materials prior to mixing at the compost site. Separated physical contaminants must be appropriately disposed. Materials received from off-site locations must be source separated.

25.05: Operation of Composting Facilities

- (1) Agricultural composting facilities must be secure from illegal dumping of waste materials.
- (2) Composting operations shall comply with all state and local regulations governing agricultural composting including those which relate to siting requirements (310 CMR 16.00) and the Department's Agricultural Compost Guidelines.
- (3) The operation of the composting facility must be done in a manner to minimize odors, noise, drift of materials, and risk to humans or the environment.
- (4) All demonstration composting facilities must be available to the Department for educational purposes on such terms as the Department may require, for the purpose of complying with M.G.L. c. 21H, s. 7B.
- (5) If an agricultural compost operator makes nutrient claims of their finished compost material, then such operators are subject to M.G.L. c. 128, ss. 64 through 83 and, 310 CMR 15.00.

25.06: Revocation Agricultural Composting Registrations

If the Department finds that any portion of the Agricultural Composting Registration application includes false or misleading information, or the operation of a registered composting facility is in violation of the regulations or guidelines, or is acting not in the best interest of Massachusetts agriculture, the Department may suspend or revoke the registration which will also revoke the exemption status and thereby the operator must comply with DEP Regulations for Determination of Need for Site Assignment as set forth in 310 CMR 16.05(4).

REGULATORY AUTHORITY

330 CMR 25.00: M.G.L. c. 21H, s. 7.

(PAGES 133 THROUGH 134 ARE RESERVED FOR FUTURE USE)

Appendix B

16.05: Applicability

- (1) General. 310 CMR 16.00 shall govern the process of application, review, public hearing and decision for a site assignment to expand a solid waste management facility or establish a new solid waste management facility at an unassigned site.
- (2) Facilities and Operations to Which 310 CMR 16.00 Does Not Apply. 310 CMR 16.00 does not apply to the following facilities or operations:
- (a) facilities that manage hazardous wastes which are regulated pursuant to 310 CMR 30.000;
 - (b) facilities which manage waste-water treatment plant residuals subject to the siting process pursuant to M.G.L. c. 83, s. 6 and regulated pursuant to 314 CMR 12.00, provided that 310 CMR 16.00 does apply to solid waste management facilities which co-dispose waste-water treatment plant residuals with solid waste;
 - (c) solid waste combustion facilities that are rated by the Department at one ton per hour or less pursuant to M.G.L. c. 111, s. 150A;
 - (d) operations which collect, store, and process only beverage containers subject to the provisions of M.G.L. c. 94., ss. 321-326;
 - (e) dumpsters, roll-offs, or other temporary storage containers located at, and used exclusively for the collection of solid waste generated by an apartment house or complex, condominium association, school, recreational areas, industrial or commercial establishment, office, individual residence or farm, construction site or demolition site; and
 - (f) the following classes of manufacturing or industrial operations which temporarily store and/or utilize pre-sorted recyclable materials in the manufacturing or industrial process, including:
 - 1. paper mills, including de-inking plants and paperboard manufacturers;
 - 2. steel mills;
 - 3. aluminum smelting operations and mills;
 - 4. glass manufacturing plants;
 - 5. plastic manufacturing plants;
 - 6. tire re-capping plants;

16.05 continued

- 7. de-tinning plants;
- 8. asphalt batching plants;

(3) Conditionally Exempted Operations. The following operations do not require a site assignment provided the operation incorporates good management practice, is carried out in a manner that prevents an unpermitted discharge of pollutants to air, water or other natural resources of the Commonwealth and results in no public nuisance:

- (a) recycling drop-off centers;
- (b) dumpsters, roll-offs, or other temporary storage containers located at, and used exclusively for the solid waste generated and collected by a department of public works;
- (c) backyard composting;
- (d) disposal of wood wastes at a single family residence or farm where the wood wastes are generated and disposed within the boundaries of such residence or farm;
- (e) operations which compost clean leaves and yard waste, provided that either:
 - 1. the operation is registered with the Department; or
 - 2. the operation is located within the property boundaries of the site where all the leaf and yard waste are generated;
- (f) the use or application of agricultural manures in normal farming operations;
- (g) a composting operation for agricultural wastes, when located at an agricultural unit as defined in M.G.L. c. 128, s. 1A; and
- (h) a composting operation, when located at an agricultural unit as defined in M.G.L. c. 128, s. 1A, which, in addition to agricultural wastes, utilizes only the following compostable materials, provided the operation is registered with and complies with policies of the Department of Food and Agriculture:
 - 1. leaf and yard waste;
 - 2. wood wastes;
 - 3. clean newspaper or cardboard;
 - 4. clean shells and bones;
 - 5. non-agricultural sources of manures and animal bedding materials.
 - 6. not more than ten tons per day of compostable material composed of generator pre-sorted produce, and/or generator pre-sorted vegetative residues from food or beverage processing that consists solely of materials from plants, (e.g., husks, leaves, skins, sediments and roots) and other plant by-products from fruit or vegetable canning, freezing or preserving operations; and
 - 7. not more than one ton per day of pre-sorted kitchen, restaurant and institutional food waste.
- (i) an asphalt, brick or concrete rubble processing (crushing) operation when:
 - 1. the operation is located at:
 - a. an active quarry or active sand and gravel pit where any rubble transported to the site of the operation is pre-sorted so it contains only asphalt, brick or concrete rubble; or
 - b. the site of a demolition/construction project where all the rubble processed is generated at the site;
 - 2. the rubble is processed so the maximum length of the largest dimension of any piece of rubble is less than six inches;
 - 3. all rebar is removed in the process and is recycled or disposed in an approved facility;
 - 4. there is no speculative accumulation of the rubble or rebar prior to or after crushing and accurate records are maintained that are adequate for the Department to determine whether speculative accumulation is occurring; and
 - 5. at least 30 days prior to commencement of operations, the operator notifies the Department and the board of health using a form as may be supplied by the Department.
- (j) baling and handling operations that process only recyclable paper (includes all grades of paper and paperboard).
- (k) a composting operation located at an industrial, commercial or institutional site which composts less than one ton per week of only those materials specified at 310 CMR 16.05(3)(h)6.-7. which are generated on-site,

16.05: continued

and where, at least 30 days prior to commencement of operations, the operator notifies the Department and the board of health, using a form as may be supplied by the Department.

(l) wood chipping and wood shredding operations when:

1. only brush, stumps, lumber ends and trimmings, wood pallets, bark, wood chips, shavings, slash and other clean wood, which are not mixed with other solid wastes, are processed;
2. no wood containing or likely to contain asbestos, glues, or chemical preservatives such as creosote, pentachlorophenol, paints, stains or other coatings is processed;
3. there is no speculative accumulation of wood or wood chips prior to or after processing. For purposes of 310 CMR 16.05, the time period for evaluating if speculative accumulation is occurring shall be 90 days; and
4. at least 30 days prior to commencement of operations, the operator notifies the Department and the board of health, using a form as may be supplied by the Department.

(m) recycling operations, except operations which recycle construction and demolition debris or special wastes, which comply with the following additional conditions:

1. the operation receives only recyclable material pre-sorted by the original generator;
2. the operation receives no more than 100 tons per day (tpd) of recyclable materials, including incidental solid waste;
3. the operation receives, handles and stores recyclable materials, incidental solid waste and residues only within an enclosed handling area or adequately covered containers or trucks;
4. the amount of residue generated by the operation does not average more than 15% of the weight of the recyclables processed during any quarter.
5. there is no speculative accumulation of any material. For purposes of 310 CMR 16.05, speculative accumulation shall be presumed to occur if materials, whether in their as-received, in-process or processed condition, are stored for more than 90 days from the date of their receipt at the recycling operation. This time limit may be exceeded in the case of storage of a processed material pending accumulation of a transportable load (one full truck load).
6. accurate records are maintained and certified reports are submitted every 90 days for the first year of operation and once a year thereafter which provide information to enable the Department to determine that the operation has complied with the conditions set forth at paragraphs 310 CMR 16.05(3)(l)1.-4. (Reports shall be filed with the appropriate Department regional office and with the board of health); and
7. at least 30 days prior to commencement of operations, the operator, on a form as may be supplied by the Department, notifies the Department and the board of health of the intent to operate.

(4) Determination of Need for Site Assignment. The Department shall make a determination of need for site assignment for the following operations upon application pursuant to 310 CMR 16.05(5). These operations shall be presumed to be solid waste management facilities unless the Department issues a determination that site assignment is not required:

- (a) recycling operations not exempted under 310 CMR 16.05(3) and handling only pre-sorted recyclable materials; and
- (b) composting operations not exempted under 310 CMR 16.05(3). Composting of unprocessed meat and fish wastes, sludges (except sludges that only contain material from plants, fruits and vegetables) and/or solid wastes are not eligible to apply for a determination of need.

(5) Determination Process.

- (a) Any person making application for a determination of need for site assignment under this paragraph shall submit an application to:
 1. the appropriate regional office of the Department; and
 2. a copy to the board of health of jurisdiction.
- (b) Information on Materials. The following information, where applicable for a given material, shall be provided by the applicant:

16.05 continued

1. a general description of the recyclable or compostable material;
2. a chemical and/or physical characterization of the recyclable or compostable material where specifically required by the Department;
3. identification of the quantity, quality and sources of the recyclable or compostable material;
4. the proposed method(s) for recycling or composting the material;
5. a description of the product(s) to be made from the material or a description of the use to which the material will be put;
6. appropriate documentation that markets or uses exist for the compost, recyclable materials or products; and
7. other information or data as required by the Department.

(c) Information on the Site. The application shall include the following descriptions, plans or other information, where deemed necessary by the Department:

1. a locus map indicating the location of the proposed facility;
2. a site map indicating:
 - a. the zoning classification of the site and adjacent areas; and
 - b. the location of all wetlands on and adjacent to the site;
3. site and design plans which include:
 - a. the location and size of all on-site storage areas for recyclable or compostable materials and products; and
 - b. the layout of all processing equipment, buildings, roads, run-on and run-off controls, where applicable, and other appurtenances.
4. the proposed method or methods for pre-sorting recyclable or compostable materials from other solid wastes prior to delivery to the facility;
5. a description of all processing equipment to be used at the facility (for example grinders, shredders, air classifiers, and screening equipment);
6. the quantity and quality of any wastewater to be produced and the proposed method of discharge;
7. the quantity and quality of any residues and off-specification materials generated and how and where these wastes will be disposed; and
8. other site specific information as required by the Department.

(d) Criteria for Department Determination of Need. The Department shall use the following criteria to determine if a site assignment is required:

1. the application is accurate and complete;
2. the material meets the definition of a recyclable or compostable material. In determining if a material is compostable or recyclable the Department may consider, but not be limited to, the nature of any contaminants and their probable effect on products or public health, safety and the environment;
3. the material can feasibly be processed, if applicable, and recycled or composted under the proposal set forth in the application;
4. the material is pre-sorted. In determining if a material is pre-sorted the Department may consider the relative proportion of solid waste to incoming recyclable or compostable materials;
5. the quantity of residues generated through the processing of recyclable or compostable materials, including rejects, does not average more than the following percentages by weight or volume where applicable, as determined by the Department, of materials handled during any quarter:
 - a. 5% for the recycling of demolition debris or construction material;
 - b. 5% for composting of leaf and yard waste;
 - c. 15% for recycling of post-consumer recyclables;
 - d. such other percentage for other materials as the Department may establish in order to minimize residue generation. The residue generation criteria may be modified by the Department under the following circumstances:
 - i. the industry average for processing materials of the same nature utilizing the best available processing equipment is different than the percentages set forth in 310 CMR 16.05(5)(d)5.a.-c.
 - ii. the scale of the facility is sufficiently small that actual residue generation is minimal;
 - iii. the facility is a demonstration or pilot project of fixed limited duration.

16.05. continued

6. there will be no speculative accumulation of materials.
7. the facility will not operate as a de facto transfer station solid waste storage facility or processing facility, for which a site assignment would be required;
8. materials and products will be handled in a manner which will not cause the development of nuisance conditions and will ensure protection of public health and safety and the environment; and
9. the proposed project can be successfully completed in compliance with all other appropriate local, state and federal rules and regulations.

(e) Determinations of Need.

1. All Department decisions regarding determinations of need for site assignment for recycling or composting facilities shall be made in writing.
2. The Department shall issue a draft determination and send a copy to the applicant and board of health.
3. The Department shall accept written comments up to 21 days from the date of issuance of the draft determination. Commentors may, in their comments, request the Department to revise with conditions a draft determination or show why the facility should be required to obtain site assignment as a solid waste management facility.
4. The Department shall issue a final determination following the 21 day comment period.
5. The Department may make a determination that no site assignment is needed subject to the applicant's compliance with conditions. These conditions may include, but are not limited to:
 - a. requirements to ensure that only exempt recycling or composting operations are conducted on the site;
 - b. weighing and operational reporting requirements, including maintenance of a daily log of the quantity of materials received and shipped, estimation or weighing of materials, depending on facility size, and regular certified reports detailing operating conditions and material disposition;
 - c. the authority of the Department or the board of health without prior notice to periodically enter upon and inspect the site, the facility and relevant operating records to determine and compel compliance with applicable regulations and the conditions of the determination;
 - d. payment of penalties in accordance with the provisions of M.G.L. c. 21A, s. 16 for violation of a condition or other requirement; and
 - e. a termination date.

(6) Violations of the Conditions of a Determination. In the event of a violation of applicable regulations or conditions established in a determination the Department may modify, suspend or revoke the determination or initiate an enforcement action in accordance with applicable statutes or regulations. Where a determination is suspended, operations shall cease until:

- (a) the operator corrects the violation to the satisfaction of the Department; or
- (b) the operator applies for and obtains a site assignment and solid waste management facility permit.

(7) Project Modifications.

- (a) The proponent shall notify the Department and the board of health of proposed changes in design or operations where:
 1. the facility operator intends to recycle or compost material(s) substantially different from those materials for which the current determination was granted;
 2. the design and/or operation of the facility is to be altered; or
 3. the facility operator proposes to increase the volume or quantity of materials to be handled by the operation above that volume or quantity established in the current determination.
- (b) Where the Department determines that the change in design or operation is significant, the Department may require a revised application for determination of need be submitted to the Department, with a copy submitted to the board of health, for review. The board of health may comment within 21 days on any proposed modification.

16.05: continued

(8) Demonstration Projects for Recycling or Composting Pre-Sorted Material. The Department may approve projects to demonstrate innovative recycling or composting techniques at unassigned sites as provided below:

(a) General Conditions. The following conditions shall apply to all demonstration projects approved under 310 CMR 16.05(8):

1. The materials to be processed shall be limited to the pre-sorted recyclable or compostable materials permitted to be processed by operations set forth at 310 CMR 16.05(4); and
2. projects shall be limited to a specified time period not to exceed one year, after which time they shall terminate unless appropriate approvals are obtained.

(b) Application. An application to conduct a recycling or composting demonstration project shall be submitted to the Department, the board of health and, in the case of agricultural composting, to the Department of Food and Agriculture. The application shall contain:

1. the information described at 310 CMR 16.05(5)(b) and (c) as required by the Department;
2. the proposed duration of the demonstration project; and
3. a description and schedule of interim and final reports to be submitted to the Department describing and evaluating the project.

(c) Criteria for Department Determination. The Department shall consider the following criteria when determining whether to allow the demonstration project:

1. the potential for adverse impacts taking into account the recyclable and compostable materials, project location, design and operating controls, management practices and operator experience;
2. the likelihood of obtaining useful, new information in the time frame proposed for the demonstration project; and
3. the ability of the applicant to appropriately use or dispose of all project materials.

(d) Department Decision. The Department shall follow the procedure described at 310 CMR 16.05(5)(e)1.-4. when issuing its decision on whether to allow the demonstration project.



The Commonwealth of Massachusetts

Appendix C



Department of Food and Agriculture

Leverett Saltonstall Building, Government Center

100 Cambridge Street, Boston 02202

July 8, 1988

TO All Massachusetts Farmers:

Ref: On-Farm Composting

The Department of Food and Agriculture (DFA) and the Department of Environmental Quality Engineering (DEQE) are working together to reduce solid waste problems in Massachusetts. We would like to personally thank those farmers who have worked with us to solve the serious landfill and water-pollution problems of this state through the On-Farm Composting Program.

Under a new solid waste law, DEQE has announced regulations, effective June 10, 1988, for the siting of solid waste facilities. As these regulations are directed to siting of major solid waste facilities, most farmers will be exempt so long as they are handling manure in normal agricultural procedures or composting organic waste as described below. (Use of a farm as a dump or land fill is not permitted). The purpose of this letter is to inform you as to your exemptions as well as how the new rules may apply if you are a large-scale composter.

Under the new site assignment regulations, the following should be kept in mind:

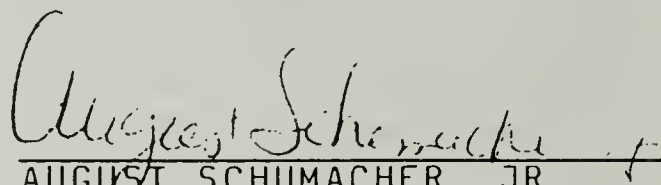
1. As a general rule, manure used or sold in normal agricultural operations is exempt from the solid waste law, because the law applies to discarded material and manure is usually used on the soil. Manure (including bedding and horse manure) which is composted is exempt from the regulations, even if composted with vegetative materials from off the farm.
2. Permitted material for composting includes fruit and vegetable food processing wastes, agricultural cuttings, seaweed, leaf and yard wastes, wood chips and brush, but does not include wood pieces or particles containing chemical preservatives, paints or other coatings. Clean newspaper or cardboard may be used as a bulking agent.

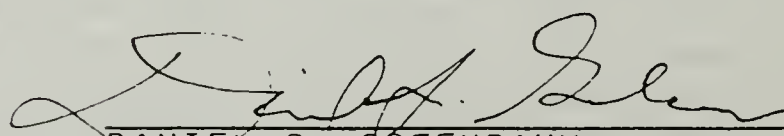
3. Composting is permitted on an agricultural unit even if all or most of the composted product is sold or used off the farm. Composting is legally considered an agricultural activity if either most of the source of the material or most of its use is on a farm.
4. The composting of meat and fish wastes will require DEQE plan approval even if it occurs on a farm. However, if the composting occurs on a farm it may be exempted from the site assignment regulations and fees under a review process by DEQE.
5. In order to properly identify materials being composted, farmers should not accept delivery of composting materials that have been mixed with other materials, except for manure which can be mixed with bedding.

DEQE will continue to regulate certain aspects of agricultural composting. For example, farmers should not locate a composting operation within one half mile of the wellhead of a public water supply if another site is available. In addition, farmers who are composting more than 50 dry tons per day or any meat and fish waste are subject to plan approval by DEQE. Farmers should contact DFA and DEQE for assistance in complying with these requirements.

DFA has also adopted regulations for agricultural composting in connection with the new law. Any farmer who composts should contact DFA for guidance and for copies of grant applications, and the new regulations.

Sincerely,


AUGUST SCHUMACHER, JR.
Commissioner
Department of Food and Agriculture


DANIEL S. GREENBAUM
Commissioner
Department of Environmental
Quality Engineering

Appendix D

MASSACHUSETTS DEPARTMENT OF FOOD AND AGRICULTURE (330 CMR 25.00)

sample

AGRICULTURAL COMPOSTING REGISTRATION:
APPLICATION FORM

I. Regulatory Requirement

Agricultural composting operations are conditionally exempt from site assignment as solid waste facilities pursuant to Department of Environmental Protection (DEP) regulations 310 CMR 16.05 (3) g, and h:

"(g) a composting operation for agricultural wastes, when located at an agricultural unit as defined in M.G.L. c. 128, s. 1A;

(h) a composting operation, when located at an agricultural unit as defined in M.G.L. c.128, s. 1A, which in addition to agricultural wastes, utilizes only the following compostable materials, provided the operation is registered with and complies with policies of the Department of Food and Agriculture:

1. leaf and yard waste;
2. wood wastes;
3. clean newspaper and cardboard;
4. clean shells and bones;
5. non-agricultural sources of manures and animal bedding materials.
6. not more than ten tons per day of compostable material composed of generator pre-sorted produce, and/or generator pre-sorted vegetative residues from food or beverage processing that consists solely of materials from plants, (e.g., husks, leaves, skins, sediments and roots) and other plant by-products from fruit or vegetable canning, freezing or preserving operations; and
7. not more than one ton per day of pre-sorted kitchen, restaurant and institutional food waste."

II. Registrant Information

Applicant/Owner _____

Address _____
P.O.Box or Street Address

Town Zip Code County

Telephone _____

Operator/Supervisor (if other than owner) _____

III. Compost Site Information

Name of Farm Unit _____

Location _____

Major Farming Activities _____

Start up date _____

Zoning Classification(s) _____

Chapter 61A? (y/n) _____

Surface waters located within 500 feet of site? (y/n) _____

Wetlands located within 500 feet of site? (y/n) _____

Public water supply located within 1/2 mile of site? (y/n) _____

Private water supply located within 250 feet of site? (y/n) _____

Please attach a map delineating the composting site, and a brief narrative which includes the following additional information:

- Acreage of parcel containing composting site
- Size of composting site and location of boundaries
- Locations of composting materials and storage areas
- Uses of land adjoining the site (e.g. residential, park, commercial)
- Identification of occupied buildings within 500 feet of site
- Any vegetative buffer between composting area and adjacent properties
- Access roads and drop-off areas for delivery of off-farm materials
- Slope and drainage characteristics
- Depth from surface to maximum high seasonal groundwater or bedrock
- Soil description and/or copy of Soil Conservation Service (SCS) map with site location marked

If additional space is needed for information in this or other sections of this application please attach pages as needed.

IV. Compost Input Materials

Please indicate if accumulated daily, weekly, monthly, etc.

	<u>Material</u>	<u>Source (farm/off farm)</u>	<u>Quantity (tons/cubic yards)</u>
1.			
2.			
3.			
4.			
5.			

Total Quantity of Compost Inputs per year: _____

V. Composting Operations

Materials delivery and holding procedures:

Equipment and methods used for mixing, piling, and turning:

Monitoring for temperature, contaminants, odor, moisture:

Site security measures and procedures:

Contingency plans for materials in the event that operations cease:

VI. Compost End-use Information

Description of end-use on farm:

Compost users or markets other than farm:

End-product quality control or analysis:

Percentages of on-farm and off-farm uses of compost:

I certify that the information contained herein and attached hereto is true and accurate to the best of my knowledge and belief, and that I have read 330 CMR 25.00: Agricultural Composting Program.

Applicant's Signature

Date

Please submit completed form to:

Composting Program
Mass. Dept. of Food and Agriculture
142 Old Common Road
Lancaster, MA 01523
(508) 792-7712

Appendix E

Resources

1. On-Farm Composting Handbook, Northeast Regional Agricultural Engineering Service (NRAES), 152 Riley Robb Hall, Cooperative Extension, Ithaca, NY 14853-5701.
2. "BIOCYCLE, Journal of Waste Recycling," JG Press, Inc., 419 State Avenue, Emmaus, PA 18049.
3. Agricultural Composting Association, Post Office Box 608, Belchertown, MA 01060.
4. DEP Composting Program. Division of Solid Waste, 1 Winter Street, 4th Floor, Boston, MA 02108 Telephone (617) 292-5969 or Fax (617) 556-1049.
5. DFA Composting Program, Bureau of Land Use, 142 Old Common Road, Lancaster, MA 01523 Telephone (508) 792-7712 or Fax (508) 365-2131.

